September, 1982
NEWSLETTER

$2.00
Vol. 2, No. 9

MICHIGAN ATARI COMPUTER ENTHUSIASTS

INSIDE:

- **Do It Yourself!**
  Upgrade Your 400 to 48K!

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EDITORIAL

By Marshall S. Dubin

My last issue! I say that with mixed feelings. One one hand, I echo the words of our first editor Jon Earl when I say that I will not miss the work. On the other hand, this has been probably one of the most rewarding jobs in my life, both for being able to learn, and for being in a position to share with so many others.

Much gratitude and appreciation goes to the many people who have contributed to make the MACE newsletter one of the most comprehensive Atari related publications around. I would especially like to thank Richard Gyzinski, our Baker Street journalist, for his technical help in producing this newsletter as well as for his fine column.

Thanks also to Sheldon (Down Memory Lane) Leemon for the many fine articles and reviews. To Jerry Aamodt, an Account Executive supreme, and to Fred Parr, whose love and care in the printing and bindry operations has made us look more like a magazine than a club newsletter. Thanks also to Robin Ward, Steve Inda, Craig Chamberlain, Arlan, and the many other contributers too numerous to mention here. We couldn't have done it without you.

As always, to continue to be able to provide you with useful, informative content, we need your contributions. I'm not talking about money! I mean information. Articles about things you've done or would like to do, game or software reviews and techniques, unique applications or ideas, news, notes, etc. We are an information forum. To share information we must be able to get information. This means YOU!

Sorry, we don't pay anything for articles. Besides, if any of you have the impression that MACE has offices in some huge glass and chrome building, with secretaries running around, I hate to disappoint you. MACE is a voluntary organization. Nobody gets paid. The MACE officers have jobs, families, and are hobbiests - like you. Actually, we ARE you! Anyone can run for office, and EVERYONE can participate. We donate the time we can, and do what we can given the limitations.

We now have over 700 members, internationally. Sure there are ways to do things better; get the newsletters out earlier, add this service or that service. But we can't do it alone. We need help. Your help. So please don't be too hard on us if things don't always go the way you might expect them to. Either that, or do a little digital excercise (lift a finger). We do the best we can, really!

Enough of this. I just hope that we were able to give you a newsletter that was enjoyable to read, as well as informative and useful to you as a computer hobbiest. A newsletter that you as members of MACE can be proud of. If this is so, then I will retire this office satisfied that I have accomplished my task.

ODDIMENTS

MACE BOOK - The BEST OF MACE book IS comming out, soon, I hope and it will blow your socks off! More on this at a later page -er date.

LAST MONTH'S PUZZLE - deadline is extended. See puzzle page for details. Come on people, it can't be that hard!

MACE SIG GROUPS

MACE has finally organized a number of special interest groups, so that members with common interests can meet more informally than would be possible at our big, crowded general membership meetings.

The following groups have registered as official MACE Special Interest Groups:

ASSEMBLER

Manager: Tom Hunt
Secretary: Phil Heavin
939-6213

BASIC

Manager: Jim Spitzer
Madison Heights
543-0961

BUSINESS SYSTEMS

Manager: Douglas Perenchio
Warren
776-7626

COMPUTER SCIENCE

Manager: Gretchan Levitan
Huntington Woods
399-6964

EDUCATION

Manager: Mark Davids
St. Clair Shores
774-9709

FORTH

Manager: Todd Meitzner
Royal Oak
542-1752

GAMES

Manager: Stephen Tobias
Sterling Heights
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Manager: Ken Hein
Utica
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HARDWARE

Manager: Chris Ratkowski
Detroit
532-5421

NEW USERS

Manager: Michael Winters
Birmingham
645-2193

UTILITIES

Manager: Charles Godfrey
Southfield
559-1272 Home
362-9110 Work

Any member who has an idea for a group, and wishes to propose the formation of that group at a meeting is free to do so.

One such group that the Board has suggested is a MACE special interest group. This group would be involved in doing the things necessary to make MACE the biggest and the best group around. Members would take on such key functions as contacting computer stores around the country in order to widen the distribution of the newsletters, putting together public domain software that could be distributed by stores to computer purchasers, thus putting MACE more in the public eye, and organizing large-scale events, like an Atari computer fair. Would you like to see MACE gain national prominence? Would you like to see the biggest Atari computer event in the country staged locally? Then join the MACE SIG! Call Jerry Aamodt, our Vice President, for more details at 574-1020.

S.I.G. NEWS

News from the SIG'S

Assembler SIG August Meeting

By Phil Heavin, Secretary, SIGASM

SIGASM held its second meeting on August 5th at my home in Sterling Heights. Our meeting started, as usual, with general socializing, discussing games we play and our plans for our mutual interest, the ATARI.

Tom Hunt opened the business portion of the meeting with the discussion of a handout he prepared for anyone interested in SIGASM. (See Tom's sales pitch elsewhere in this issue.) Next, we established the meeting places for our next three meetings. An interesting note on this for you West siders, is that only East side houses have been offered for our meeting places. If SIGASM meetings are to be convenient for all our members, some West side MACE members will have to join us and offer to hold a meeting at their house or find a meeting place for us.

Next we discussed possible topics for our next few meetings and have more than enough to see us through the end of this year. We also decided that we will try to get together a dual disk system at our meetings to speed the exchange of programs among our members.

Next we split into two groups. I conducted an introduction to assembler programming for the beginners in the group. We spent an hour discussing in DETAIL a program to add two numbers. Meanwhile, those who felt that they already knew how to add, conducted their own discussion group on possible SIG projects for the future.

After we each finished our separate sessions we got back together and discussed specific implementation details of an arcade game I have been writing for several months.

October's meeting will be Thursday, the 7th at the home of Frank Demasek in Utica. You can contact Frank at 739-2832 or me at 939-6213. The meeting will begin at 7:00 with socializing and free form discussion with the actual business portion starting at 7:30. This part will be kept to a minnium so we can get to the fun part. There will be our usual beginners session covering part of 6502 assembler language and another session on starting to write an arcade style game completely in assembler language. We hope to see you there.

****

SUPPORT YOUR LOCAL ASSEMBLER SIG

By Thomas H. Hunt, Leader, SIGASM

Tired of sitting alone and feeling like you're reinventing the wheel? (There just must be a better way to program this!"). Baffled by the inner workings of the ATARI DOS and Operating System? ("If I just understood CIO it would be a snap to ..."). Frustrated by the limited graphics and animation capabilities of BASIC? ("How in the heck did they ever do STAR RAIDERS?") Can't seem to grasp the 6502? ("TXS? I thought it was impolite to point!").

Well, bunkie, start solving these problems by actively participating in the Assembler Special Interest Group. Presently, using 6502 Assembly Language is the ONLY effective way to resolve most of the above problems. The Assembler SIG is specifically addressing these (and many other) problems. As a cohesive group, we can form a firm foundation on which to create bigger and better programs -- using Assembly Language where necessary.

The Assembly Language, like any other programming language, is not an entity unto itself. Rather, it is a tool used to create a myriad of final products called Applications Programs. It is like the hammer -- inglorious in itself, yet in the hands of a skilled craftsman many wonderous things can be created. On the other hand, it can also be used to create a wide variety of smashed fingers and colorful explicatives!

Bearing this in mind, the purpose of the Assembler SIG should become clear -- we must concentrate on the tool and its proper uses rather than on a series of complex end products. Remember that a seemingly complex

continued

program is nothing more than a series of elementary operations cleverly intertwined. They are also much easier to understand when taken in small doses.

Therefore, the Assembler SIG will place emphasis on these elementary operations by teaching them, develop-ing and documenting them, and making them available to members of MACE. We will also concentrate on the fascinating new areas opened up by the unique hardware available only in the ATARI machines.

Once the simple operations are understood, then you are ready to move on and effectively tackle the more involved programs found in the Applications - oriented SIGs. For those interested, the Assembler SIG has prepared a handout that describes our goals, purpose, projects, and planned topics for lectures and discussions. You can't really understand how a computer works or appreciate what a high level language does until you have programmed in assembly language. Start by actively participating in the Assembler SIG! We need your help -- regardless of experience level. A willingness to participate and learn will rapidly overcome a lack of experience. See you at the next Assembler SIG meeting!

EDUCATION SIG

Meeting: Wed. September 29, 1982 at Mark David's House at 7:00. We will demo some pre-school programs at the meeting. We are also looking for some "grade book" type of programs. For more information, please call Mark Davids at 774-9709

UTILITIES SIG

At the August meeting of our group, we reviewed Programs of the Data Base type. Demonstrations were given on two programs from APX and the version that was in five issues of Softside Magazine. We were disappointed that we were unable to obtain a copy of File Manager 800 which we had hoped would be the highlight of the meeting. Maybe some other time. The topic for the September meeting is sorting methods.

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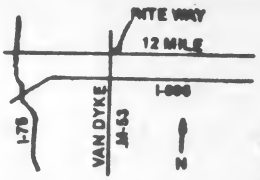

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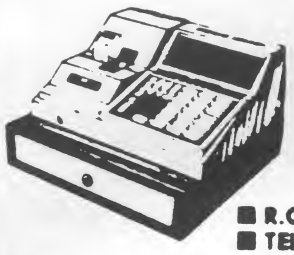

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A 48K UPGRADE FOR YOUR ATARI 400

By Claus Buchholz

[Editor's note: Atari Inc. does not recommend that you try the following modification. After all, they don't even acknowledge that a 400 can be upgraded to 32K, much less 48. Need we remind you that actually opening up the case and playing with the insides will void your warranty? This modification is not for the fainthearted or the clumsy--one little Oops! and your 400 is DOA. We at MACE cannot even vouch that the mod works, as we have not ourselves tried to duplicate the author's success.

Nonetheless, we know that among our members there are a few incorrigible hackers who think that hardwired spaghetti improves the machine's asthetic value, as well as some who can't resist a bargain. Although we don't want to encourage you, we would rather have you down in the basement ripping your computer apart than out on the streets where you might do some real harm. So in the interest of public safety, we publish the following article. We suggest you have the Harware manual handy as well, to refer to the schematics and block diagrams. After all, you've got almost $250 invested in your computer!

For the rest of you, you might note that the price of commercial modifications has been coming down as of late. We have just been informed by Cliff Blake of Screensonics that they will install a 48K mod in your 400 for the low price of $159, complete! They will also do GTIA upgrades for $30 installed. They have a huge parts inventory, including all sorts of useful things for hackers, like rolls of nine-conducter cable for the joystick ports, joystick extension cables with molded plugs, 13 pin serial-port connectors for long extensions, aracade type button switches, etc. The address for Screensonics is 14416 S. Outer 40 Road, Chesterfield, MO 63017).]

None of us needs to be reminded of the awesome power of the Atari personal computers. What many fail to realize is that, except for the full-stroke keyboard and greater configurability of the 800, the Atari 400 shares all the power of her big sister. The high performance/price ratio of the 400 makes it a very attractive computer.

The 16K RAM supplied (8K in earlier models), however, is simply inadequate for many users' needs. Atari designed the 400 to address 32K but they don't sell 32K boards. Other manufacturers sell 32K and 48K boards, but their added cost severely decreases the performance/price ratio that distinguishes the 400 from other computers.

I have designed and implemented a 48K upgrade for the 400 that you can add for about $70 and a few hours' work. With 48K, you can run nearly every program written for the Atari computers, including that program you've not finished writing because, "It won't fit!"

The modification is based on the idea of replacing the existing 16K-bit (or 8K) RAM chips with the newer 64K-bit devices. These dynamic RAMs are operationally compatible with the 16K chips. Note the two major differences: The 64K RAMs have an additional multiplexed address pin to access the larger memory. Also, they need only a single 5V power supply as opposed to the 5V, 12V, and -5V supplies which the 16K RAMs use (see Figure 1 for a pinout comparison).

Some circuitry must also be added to allow the 400 to address 48K. Note that the new RAM chips can hold 64K of memory, but the Atari can only address 48K. If you can't bear to waste the extra 16K, see the suggestions later in the article.

The parts listed in the Parts List are available from many mail order houses who advertise in the back of most computer magazines. You will also need a fine-tipped soldering iron, an ohmmeter, small pliers, screwdrivers, solder, fine wir ., and a clean and static-free place to work. You should have a little experience in working with electronics. If you don't, find a friend who does and could help you.

The first step is to open your 400. Disconnect all cables. Turn the 400 over and remove the four screws in the underside of the plastic case. While holding the case together, turn it over again. Open the cartidge door and remove any cartridge, leaving the door open. Lift the rear of the top half of the case over the door. To remove the case top from the keyboard, press on the bottom of the keyboard on either side until it bends, and slide the keyboard away from you. The case top should now be free. Now remove the keyboard by pulling straight up on the flexible connector under the right side of the keyboard.

continued

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The circuit board on the right is the power supply. The computer is inside the metal case. Remove the two screws that fasten the left side of the power supply board to the right side of the metal case. Gently but firmly pull up the left front side of the power supply to disconnect it from the main board on the bottom. Be careful of the plastic interlock switch plunger when moving the power supply board. Now remove the speaker connector from the left front of the main board, and lift the metal case out of the plastic case bottom.

Turn the metal case over and remove all the screws and the bottom plate. Now pull the main circuit board up and out of the metal case, taking care not to flex the board. You may have to gently pry the edges to loosen the board from the metal case.

You now see the 400 in its full splendor. Lay the main cicuit board down so the joystick ports face you. The smaller boards sticking up are the memory board and CPU board. The one nearer to you is the memory board. Unplug each, again being careful not to flex the circuit boards. You may also remove the beige plastic piece on the main board by bending its prongs underneath the board.

Look at the CPU board. It has three large chips. The middle one is the CTIA or GTIA. If you want to replace your CTIA with a GTIA, now is the time to do it. See the feature article in the March, 1982, issue for instructions. The CPU board is not altered in this memory upgrade, so put it away.

Look at the memory board. The eight chips along the top are the RAM chips. The other four chips are the addressing circuitry. The edge pin connectors at the bottom are labeled as in Figure 2. If you have an 8K 400, you must alter the memory board before proceeding with the upgrade. Instructions for this modification appear at the end of the article.

The first step in the 48K modification is to eliminate the 12V and -5V sources on the board and move the 5V source to where 12V used to be. As shown in Figure 3, cut the trace going from pin X of the board's edge connector to the capacitor C521. Also cut the trace going from edge pin Y to C523. Cut the traces cleanly and completely. Be careful not to slip and damage adjacent traces.

Now remove the capacitors C521 and C523. The trace coming from pin W carries 5V. Using a short piece of wire, make a solder bridge between this trace and the old 12V trace, at the point where C523 used to be (see Figure 3). Next, remove the eight capacitors C503, C505, C507, C509, C511, C513, C515, and C517, which are usually in a row along the top of the board.

We now have 5V going to pins 8 and 9 of the RAM chips, and no connection to pin 1. Remove the eight RAM chips and insert the 64K RAMs in their place, properly orienting the notched ends. With an ohmmeter, make sure there is no connection between edge pin X and pin 1 of the RAM chips. There should also be no connection between edge pin Y and pin 8 of the chips, nor should there be any connection between any two of the edge pins W, X, and Y.

If all has gone well, the board should be functioning exactly like a 16K memory board, since the addressing circuitry has not yet been altered. Now may be a good time to test the board (particularly the new RAM chips). If you wish, reassemble the entire computer and check to see if it works properly as a 16K 400. If it doesn't work, recheck all connections and disconnections made so far.

Now take the 5V supply off pin 9 of the RAM chips. To do this, cut the rightmost wide trace on the chip side of the board (see Figure 4).

Pick up the 74LS158 chip, which is the same as the chips Z503 and Z504 on the memory board. With needlenose pliers, carefully bend up all the pins except 1, 8, 15, and 16 (see Figure 5). The remaining four pins are to be soldered onto the chip Z503. Remove the chip at Z503 from its socket and place the 74LS158 on top so that the four pins listed above touch the same four pins on the lower chip (as in Figure 5). Carefully solder each of the four pair of pins together, being careful not to get too much solder on the end of each pin.

Now solder a 4" length of wire to each of the pins 2, 3, and 4 of the top chip. Reinsert the chip pair at Z503. Solder the wire from pin 2 into the hole attached to edge pin M, and the wire from pin 3 to edge pin U. Next solder the

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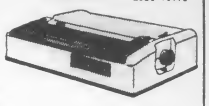

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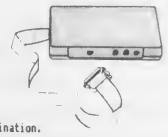

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wire from pin 4 to a hole in the former 5V bus, the wide trace along the top of the chip side of the board.

The memory board is now complete. With an ohmmeter, check all connections diagrammed in Figure 6.

The final stage involves modifiying the main (mother) board itself. To help you visualize this stage better, I have included a partial schematic in figure 7, and a pin diagram in figure 7a. Locate chip Z103 forward of the memory slot (see figure 7a). On the underside of the board, cut the traces leading from pins 1 and 2 of Z103. Now attach a wire from pin 24 (across from pin BB) on the underside of the CPU board slot to pin U under the memory slot. Attach a second wire from pin CC under the CPU slot to pin M under the memory slot.

Now wire the circuit of Figure 7, using the pin diagram of figure 7a. On the 14-pin socket, solder pins 3 and 4 together with a short piece of bare wire. Do the same with pins 2 and 13. Next solder an 8" length of wire to each of the pins 1, 5, 6, 7, 11, 12, and 14. With these wires, make the six connections to the underside of the cartridge slot as diagrammed. The seventh wire from pin 1 goes to pin 18 on the underside of the memory slot.

Plug the 74LS02 into the socket and bend the wires around some notches on the edge of the main board so as to position the chip above the board, between the crystal and cartridge slot. Finally, solder one of the 680 ohm resistors between pin A under the cartridge slot and the nearest ground connection. Be especially careful that excess solder does not form "bridges", making electrical connection where none should exist. Put the second resistor between ground and pin 14 under the cartridge slot.

The modification is finished. Recheck all connections, as an improper connection may damage the computer. Reassemble the computer, being careful that the 74LS02 chip doesn't touch any other circuitry. It's a good idea to wrap the chip in some electrical tape.

Plug in the 400 and turn it on. If the blue screen doesn't come up quickly, turn it off immediately and check that your work, including reassembly, has been done correctly. If you have exercised proper care, you should now have 48K of RAM for your 400. Enjoy.

MODIFYING AN 8K BOARD

Near the center of the board are six pair of holes, marked A through F in which two resistors reside. Remove both resistors. If one of them is at C, leave it there. Otherwise, solder one of the removed resistors at C. Now solder a wire from edge connector pin H to the trace that connects holes D, E, and F together.

Next, cut the trace leading to pin 13 of the chip at Z501, and solder a wire from this pin to edge connector pin U. The board is now ready to be modified for 48K as described above.

SUGGESTIONS FOR A 64K MODIFICATION

Figure 8 shows a circuit that will allow you to access the unused 16K on your modified board. After you have successfully completed the 48K modification as described above, disconnect the wire you put between edge pin U and pin 3 of the 74LS158. Wire the circuit of Figure 8 in its place.

Two more chips are needed for this circuit, a 74LS00 quad NAND gate, and a 74LS74 dual flip-flop. They may be wired to the memory board using sockets as you did with the 74LS02. The NOR gate on the left is from the 74LS02 chip you wired to the main board. You may bring its output to the memory board through an unused edge pin such as pin V.

The extra 16K is bank switched with the middle 16K of the 48K RAM. By writing a 1 to a memory location between D700 and D7FF (55040 to 55295 decimal), you replace the middle 16K of your 48K with a new bank of 16K. When you write a 0 to the same location, you get the original bank back. This is best done in machine language, since you can confuse BASIC by switching out part of a BASIC program.

Although you must be careful in using this extra 16K, it can come in very handy for storing extra graphics screens or other kinds of data. I have not yet implemented this 64K modification, so I leave it to the more adventuresome of you to build, test, and use.

continued

FINAL NOTES

When a cartridge is inserted into the 400, the addressing circuitry disconnects the top 8K of RAM. For example, with the BASIC cartridge you have only 40K of RAM. This is normally the case with the 800. If Atari ever comes out with a 16K ROM cartridge, it will properly disable the top 16K of RAM when inserted.

Remember that performing this modification will void any warranty remaining on your 400. If you just can't get the modification to work, you may repair all the cut traces, remove added circuitry, and reinsert the orginal RAM chips to restore your 400 to its original condition, assuming nothing was damaged.

PARTS LIST

QTY	ITEM
8	4164 200 nanosecond dynamic RAM
1	74LS158 quad 2 to 1 multiplexer
1	74LS02 quad NOR gate
2	680 ohm 1/2 watt resistor
1	14-pin DIP soldertail socket

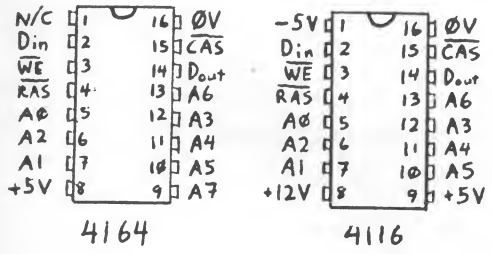

Fig. 1 - Pinout comparison of 64K- and 16K-bit RAMs

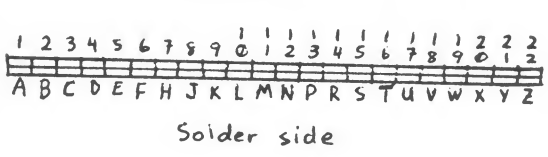

Fig. 2 - Connector identification for memory board, seen from below

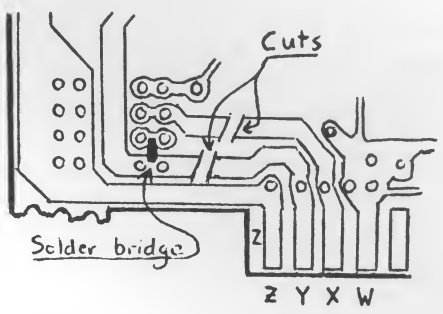

Fig. 3 - Lower left corner of solder side of memory board

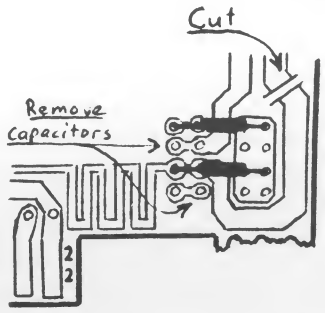

Fig. 4 - Lower right corner of chip side of memory board

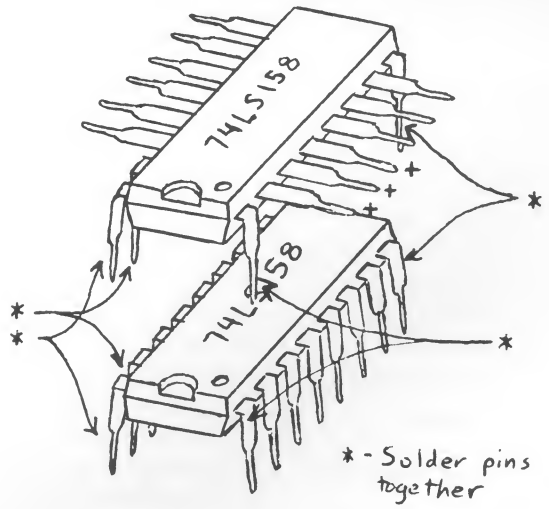

Fig. 5 - Piggyback arrangement

continued

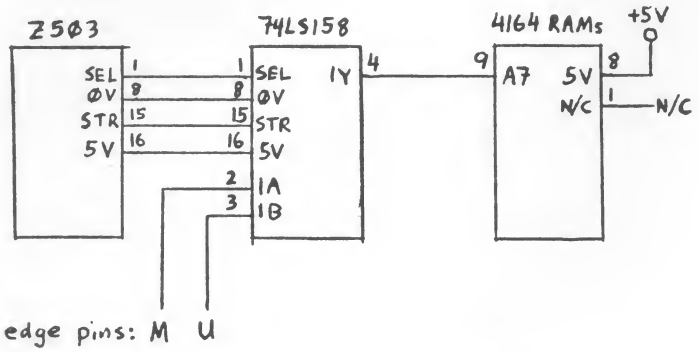

Fig. 6 - Schematic for memory board modification

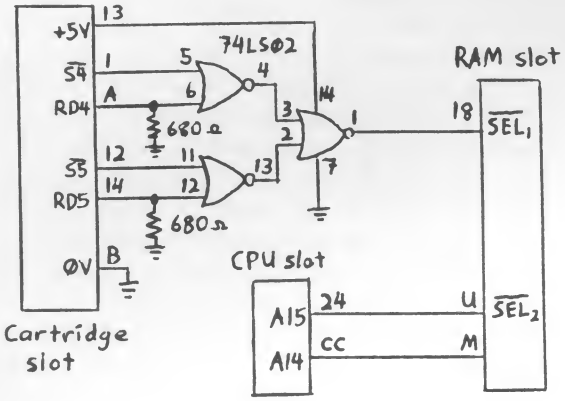

Fig. 7 - Schematic for main board modification

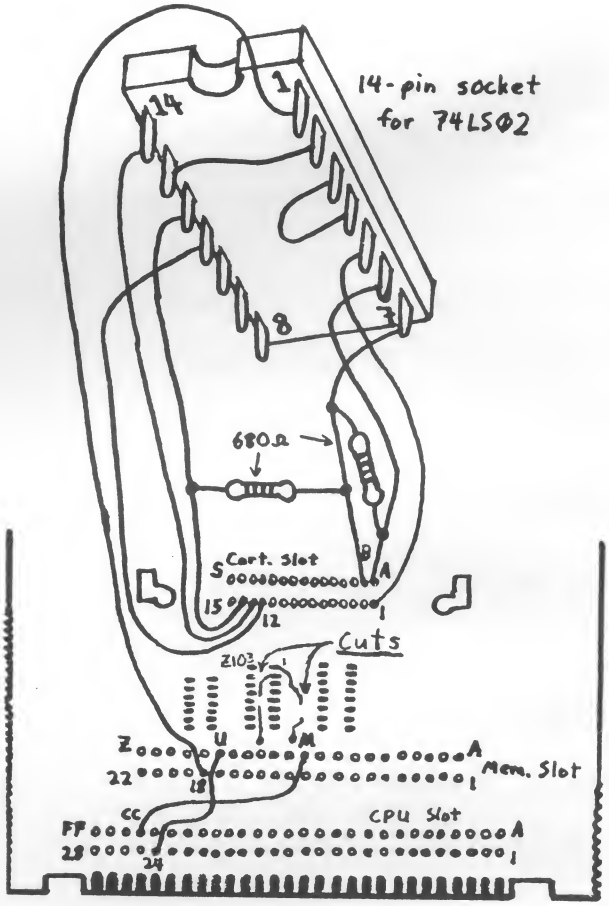

Fig. 7a - Connections for main board modifications

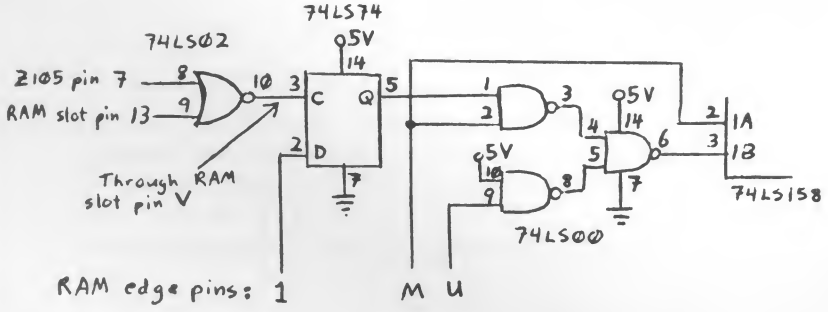

Fig. 8 - Schematic for 64K modification

Atari Sound and Graphics

By Herb Moore, Judy Lower, and Bob Albrecht.(John Wiley & Sons, Inc.,234 pages, paperback) suggested retail price: $9.95

Reviewed by Sheldon Leemon

In this second book on Atari BASIC in the Wiley Self-Teaching Guide series, the authors have taken into account the large impact that color graphics and sound have had on the market for home microcomputers. With these capabilities, a computer is no longer just a machine to help figure your income taxes, or facilitate boring math drills for the kids, but can be a super video-game, music synthesizer, artist's tool, and much more. It is just such possibilities as these that have led many consumers who formerly shied away from computers to take the plunge and purchase one for their own home. These people represent a new kind of computer owner--they want to be able to DO something with the machine without first having to get a master's degree in computer science. Graphics and sound present an ideal opportunity to such people, because from their first programming session they can give the computer commands whose results they can see and hear immediately. It is no wonder that many educators are excited about languages with "Turtle" graphics as a means of involving young children in the programming experience. And it is no wonder that the first thing many new computer owners want to know is how to control the colors and sounds that the machine can produce.

The first Wiley Self-Teaching Guide took the traditional approach of formally introducing the "core" BASIC keywords, and concepts such as conditional structures and loops first, and then at the end briefly looking at graphics and sound "extensions". This book, however, reverses those priorities, in order to meet the needs of the new computer user. First, the SOUND statement is examined, and the user is taught to type commands to produce a wide variety of sounds. Next, the user is led through simple PLOTting of colored dots, then drawing lines, and whole pictures. Eventually, the traditional programming concepts begin to ease their way into the picture, in the context of answering questions about ways to make the computer do even fancier sound and graphics. Do you want to produce a whole range of sounds without typing each SOUND command in, one at a time? Would you like to pause between each note? The book shows you how to use a FOR-NEXT loop to accomplish these tasks, and shows you how to nest loops to combine these functions. For picking out the notes of a song, the READ, DATA combination is explained. Some of the ways that BASIC concepts are introduced are quite inventive, allowing almost the entire range of BASIC keywords to be covered, while still remaining within the original framework of exploring graphics and sound. The whole time that the authors are showing us how to use arrays to hold note values, and conditional structures to check that INPUT data is within permissable parameters, they are also exploring such concepts as the effect of attack and decay times on the shaping of musical notes.

For those not familiar with the Wiley Self-Teaching series, the approach that they used should be explained. The books are written in a friendly, non-technical style, and when jargon cannot be avoided, there is usually a cute cartoon explaining the term, and reinforcing the concept. For example, in the beginning, a cartoon character reminds you to hit the RETURN key after entering a statement. They assume no prior knowledge about computers whatsoever. The book takes you through the most basic concepts, such as the difference between entering a command directly, and typing it as part of a numbered program statement. Each topic is adressed as part of a hands-on session. It is assumed that as you are reading the guide, you will be typing in the examples, and observing the effect on the screen. The result is a guide that is extrememly well-suited to the first-time user. Anyone should be able to sit down at the computer, and within a few minutes be typing in and running simple programs. In this particular guide, those programs are of a nature that will be likely to stimulate furthur inquiry and experiment into the fields of graphics and sound.

The subject of Atari graphics and sound covers a lot of territory, and in no way should anyone mistake this guide for a comprehensive treatment. However, for the beginner it serves as an excellent introduction to the graphics and sound capabilities of the Atari computers, and through them, to BASIC programming in general.

CORRESPONDENCE

I would like to introduce myself. My name is Jeff Woodward and I live in Birmingham, England.

I am an Atari 400 owner, and have had the machine upgraded with the Mosaic Ram board to 32K.

I got in touch with the Mace Atari User Group in September 1981, and have since joined. Having done so, I have corresponded with Sheldon Leemon and he invited me to write this article for all you Mace members.

First off, I would like to say how I came to buy the 400 machine. The Home Computer scene in England has probably been going now for some five or more years, and the most popular machines on the market were the Pet, the Apple and probably the TRS 80. However, very little coverage was ever given to any of these machines, and they tended to be owned and used by very dedicated computer enthusiasts only. However, with the onset of the Sinclair ZX 80, and now the ZX 81, the computer was pushed by the media, and it seemed to be the thing of the future.

I did try the ZX 80 but the shortcomings of the machine were particularly obvious when I wanted to play the Arcade type of games. Of course there are upgrades, but if any of you have ever seen the machine, you will know that these are woefully inadequate when compared to the Atari.

A great deal of excitement was generated with the announcement of the Vic 20 machine, and this seemed to be the one for all home computer enthusiasts. At this time computer hardware shops started to sppear in the area, and having read about the Atari in computer magazines, I was able to compare memory, resolution, software, and other important items between it and the Vic. I have owned by Atari for over a year now and I am convinced I made the right choice. By the way, it is only very recently that Atari has been advertised by the general media, such as television!

The software support and general help for users in this country is not easy to find and, at the moment, it is only possible to buy American computer magazines, such as Compute and Analog -- which I think is excellent -- and from these I have discovered that prices for the Atari, both software and hardware, are much lower in America. For example, based on the current exchange rate of $1.75 = L1.00, the 400 machine with 16K ram would cost $604 over here, and the 800 -- also with 16K -- would be $1050.

Similarly, I have found that it is cheaper to buy programs direct from the States - even allowing for the fact that I have had to pay Customs duty on a couple of items!!!

Software is mainly American based, with cartridges featuring the best type of Action games! I refer to Star Raiders, Missile Command and Space Invaders. There are a few software houses in England at the moment, working on Atari type programs, and the one that comes to mind is the excellent Thorn EMI cassette based programs. The one I have seen and played is 'Darts', a typical English Pub game, and this is excellent in its graphical display, musical notations, and skill levels to simulate the game on a Home Computer.

Other programs are promised by this company, and they include The Rubik Cube, which will enable the Cube to be solved on the screen; Hickory, Dickory Dock a game based on nursery rhymes; Submarine Commander, an Arcade style World War II simulation game; and also a 747 Jumbo Lander, a flight simulation game. Another software program which has recently been released by another company is called Airstrike. It is a full machine language program and it is very similar to the Arcade type Scramble games.

One facet of computers that drew me was the fact of being able to play the Adventure type game. I have the Temple of Apshai, which I find an excellent game, and Sheldon has told me that there are soon to be a whole range of Dungeon and Dragon, and other types of Adventure games, coming on to the American market. One he mentioned is Zork, and Zork 2. If any of the readers would like to contact me, about these specific type of games, I will be very pleased to hear from them. Also, any correspondence regarding the Atari games and programs, new magazines that may have appeared in the States, or anything that you think would help us over here, would be very welcome.

I hope that this has given you some insight into the way the computer scene is starting to take off in England, and I hope that it will be start of further correspondence with users in America.

If anyone would like to get in touch with me, my address is:

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JUMBO JET PILOT**

Designed by Thorn/EMI(floppy disk and cassette for the Atari 400/800)

By Sheldon Leemon

The British are very different from you and I. To us, the words "computer game" conjure up a picture of a lone defender with his trusty lazer blaster, sending hordes of invading lizard-men to meet their scaly Maker, to the accompaniment of a riot of bleeps, bangs, and other electronic sound effects. What the British think of is, well, Jumbo Jet Pilot.

Jumbo Jet Pilot is one of a series of popular computer programs which were produced in England by Thorn/EMI for the Atari 400/800 computers, and which are now being introduced into the U.S. market. The program is a flight simulator, which puts you at the controls of a Boeing 747. Your mission is to successfuly take off from airport A, fly to airport B, and land safely. One look at the display screen lets you know that this is not quite as easy as it may sound. The control panel has indicators for airspeed, elevator positions, angle of elevation, speed of ascent or descent, heading, longitude and latitude postion, rudder setting, angle of roll, fuel, landing gear and brakes, plus a grid map, a horizon simulator, and a view out the cockpit window. Trying to familiarize yourself with the controls through random trial and error is likely to produce a runway crash, followed, not by the customary FAA investigation, but rather a printed message to keep a stiff upper lip and "try again". Faced with this desperate state of affairs, your only resort is to read the instructions, which briefly explain the operation of the controls, and a few of the rudiments of flying. For more detailed information, you are referred to your local library(!), where you may find books(!) on the subject.

By carefully following the printed directions, you are soon airborne. Staying that way is another matter, for it is none too difficult to lose control and go into a stall or a power dive (thus activating the game's only real sound effect, a maddening warning siren). There may be a way to recover from these catastrophes, but even the pause feature, that lets you stop in mid-crash to try and figure things out, couldn't prevent me from doing a bad kamikaze imitation. Landing is more difficult still, particularly if you insist on staying in one piece. There is a fair degree of challange in just mastering the basic mission, and once you've done that, there are four higher difficulty levels to contend with, as well as night flying.

Whether you will want to progress to doing loops and barrel-rolls is a different story. The graphics are convincing, and quite well done, but consist mainly of gauges and other indicators. You have a view out of the window of the airfield on takeoff and landing, but if all goes well, most of the time you will see nothing but blue skies, and a dark horizon line. The number of instruments you need to monitor seems about right to keep you involved, without turning the 45-minute flight into an endurance contest. Although the controls are for the most part realistic, there is a disturbing lag between the time you change a setting, and the time it produces a change in your instrument readings. But the most serious problem with the simulation is that it sucessfully recreates the job of flying, without imparting any sense of the joy of flight. So while you may come away with a somewhat better idea of how to fly a plane, the simulation is not likely to kindle a desire within you to do so.

The odds on this cerebral entertainment replacing the lizard-man seem not much better than those of Masterpiece Theater supplanting the Dukes of Hazard, so don't expect to hear "Jumbo Jet Pilot Fever" on the radio anytime soon. Like a dancing bear, this program is an interesting novelty, but not necessarily one that you would want to own.

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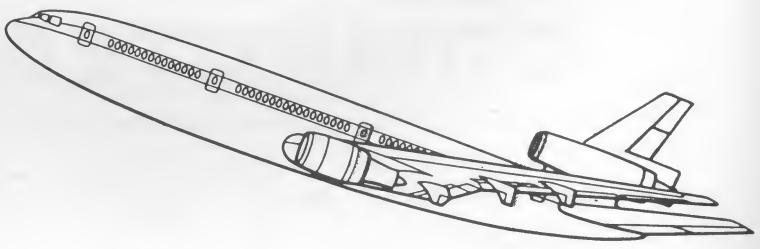

KEYBOARD INPUT

By Jerry White

If you are new to the world of computers, any typewriter or keyboard may seem quite complicated. If you think your ATARI keyboard is complicated, you're absolutely correct. It has all the features of most typewriters and more. The more features built into a device, the more complex it becomes to use.

The ATARI keyboard, combined with a highly sophisticated screen editor, provide the programmer with valuable tools for man/machine communication. These same tools can also become the programmer's nightmare.

Confused? That's what this article is all about. Any new computer owner is bound to be overwhelmed by all the technical mumbo jumbo associated with computers. Don't panic!

Begin by reading the Owner's Manual. Take your time, and try all the examples. Don't try to learn too much at one time. The beginner must realize that it takes time to learn how to use a computer. It takes time to learn how to use programs. And it takes a great deal of time and effort to learn to write useful programs.

In the ATARI computer owners manual, chapter six explains the use of the keyboard and screen editing functions. TRY THE EXAMPLES! You won't hurt the machine so don't worry about making mistakes. After all, you're only human.

When I said that the keyboard and screen editor could become the programmer's nightmare, you may have been puzzled. A programmer is supposed to know what he or she is doning. So what's the nightmare?

The programmer has to remember that the program user might make a mistake. The user isn't supposed to worry. The computer should be smart enough to understand human errors. The problem is that "the computer" is only as smart as the program that is in control.

Suppose my program must ask you a question and that the answer can only be YES or NO. How simple can you get? To make life even easier, a message appears on the screen and asks a simple question. Then a line appears that says, "Type Y or N." If the user types a "Y" for YES, the program does one thing. If the user types "N" for NO, the program does something else. But what if the user types something else?

Any programmer should be able to handle that right? The program should just inform the user that it expects a "Y" or "N" and ask the question again. But what if the user typed a "y"??? The dumb machine should have known that a small letter "y" means "YES" too.

You are absolutely right again. But some programs are not written to handle situations like this. It may be because the programmer wasn't an expert, or possibly because the program was meant to be a simple example. Error handling requires additional instructions in a program. In any case, the novice computerist should be aware that in most cases, a program expects upper case, normal video responses from the user.

Normal video??? So what's abnormal video??? Here we go again. The ATARI keyboard provides a key that changes the display of characters from light on dark to dark on light and vice versa. This key is just to the left of the right shift key. The "abnormal" video is called inverse video. When this key is pressed once, inverse video is in effect until that little ATARI logo key is pressed again.

Our little Y or N example now takes on another dimension. The Y could be upper case normal, lower case normal, upper case inverse, or lower case inverse. And please don't ask about the CTRL key.

What happens when the CTRL key is pressed? I asked you not to ask that. I'm running out of room in this column so you'll have to try it and see for yourself. That's the key. Try it. Keep your manuals within easy reach and don't hesitate to look things up. Computers are logical machines and yours is no exception. Using logic and trial and error is a good way to learn. In the world of computers, it is often the best way.

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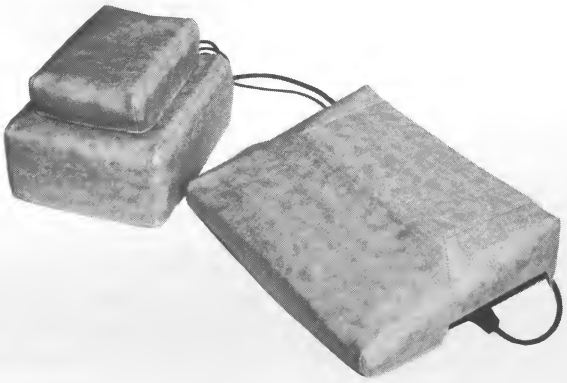

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IN THE BEGINNING

By Richard Gizynski

Learning to program is a lot like learning how to type. Try to learn by small, overlapping steps. Baker Street is going to explore some beginning and intermediate questions new programmers have. Just as you can learn to drive a car without knowing its engineering details, you can learn to use your computer without knowing its details. But knowledge can turn your computer from 'sedan' to 'sports model'.

To those of you that are new to Atari programming, there are two excellent books and a short manual that will help you get started. The soft cover 'ATARI BASIC -- A Self-Teaching Guide' is a book that every beginner should own. It takes you through a step by small step exploration of fundamental BASIC commands. It also provides short, easy to understand examples of these commands.

The second book you should consider is Stimulating Simulations by C.W. Engel. This is a collection of game programs for the beginner to type in. The collection demonstrates, again in step by step fashion, how a program is organized, written and expanded. There aren't any graphics routines in the book, but entry level programmers shouldn't concentrate on graphics.

The third selection is a super time saver called 'Master Memory Map' by Santa Cruz Educational Software. Memory Map is a listing of the most useful memory locations in your Atari and a very short description of what they do. It is organized in numerical sequence and is a handy quick referance.

Now let's explore some terms that may be new or foggy to you. Two terms that pop up when we talk about memory are "bits" and "bytes". A bit is the smallest unit of information that a computer can handle. A byte is a grouping of eight bits. I'll show you the how and why of these.

Computer memories consist of thousands of small areas that can be turned on or off. These areas may be miniature circuts, magnetic 'bubbles' or blips or holes punched in paper. All that is necessary is that they can be created and read individually or in organized groups. They are the 'bits' of a computers memory. They can be (and are) represented by a one or a zero. A one usually means that a bit is on or present. A zero means a bit is off or absent.

To form more complex units of information, eight bits are strung together to form a byte. By using eight bits, we can represent numbers up to 255. Starting at a bit we call the least significant bit (the one on the furthest on the right like our normal decimal number system) we consider each bit as an exponent of two. The right most bit has a value of one (or a place marker like the zero in 30). The next bit has a value of two. The third bit has a value of four. Each additional bit is two times the previous bit (or a place marker). The most significant bit (the left-most bit) of a byte has a value of 128. By using this system, we can represent a number from zero (all place markers) to 255 (all bits on). Count 'em -- 128 + 64 + 32 + 16 + 8 + 4 + 2 + 1.

Why and how bytes are used is easier to understand if you think of our alphabet and numbering system. We have 10 digits that can be strung together to form a number of any size. Our alphabet has 26 capital and 26 lower case letters that do the same thing with words. Both our alphabet and our numbering system also use special characters. Periods, commas, dollar signs and a large number of other symbols are added to the basic digits and alphabet characters to form our written language.

You can use a number to represent each of the characters, digits, symbols and the spaces that seperate them into meaningful groups. When you look at your Atari keyboard, you see 56 keys a space bar and four special purpose buttons. Add to this all of the characters that are available by using two or three key combinations (shift and control characters). You need 255 seperate numbers to represent all of the possible combinations. You also need a zero to mark a 'no information' condition.

(To be continued)

BANKSHOT

By Stan Ockers

Here it is ....yet one more attempt at a Player Missile routine that makes player movement 'simple'. The problem with the 'universal' routine in 'Chicken' was that it was almost completely independent of Basic. Once set up, everything continued to move, even if the Basic program was stopped. Other problems seemed to crop up because a seperate load player routine was used. If a vertical blank interrupt occured part way through the loading process, unexpected things could happen. The load routine should be part of the VBI movement routine.

I decided to start from scratch. This time I've provided an assembly listing of what I came up with. As usual there are a number of special locations in page six. Each player has locations that can be poked with X and Y positions as well as one which can be poked with a number that determines the image used. Table 1 lists page six locations.

The routine itself is completely relocatable and is stored in VB$. All players are updated during each VBI ... horizontal positions are always updated while vertical positions are updated only if the new vertical position for that player is different from the old. In such cases, zeros are written into the appropriate player area until the proper vertical position is reached.

The image to insert is determined by an even number 0,2,4..... The numbers refer to a set of pointers loaded into page six starting at 1568.

The pointers are the addresses of strings which hold the images. After loading the image, the rest of the area for that player is zeroed out. Jumps from one point on the screen to a second point quite far away can be immediate. To show motion the interven
ing positions are used.

What has to be set up for this routine to work? Well, first of all the routine is only for single line resolution and only for 4 players (no missiles). Refer to the listing of 'Bankshot' for the lines that follow. The routine has to be put into VB$ (lines 250-302) and its address put into a machine language insertion routine (line 380, this routine hooks our routine into VBI). Room has to be set aside for the player-missiles and the Hi byte of the address of this area given to 1551 as well as CTIA (line 610). All strings representing images have to be filled and their addresses (Lo and Hi bytes) placed in the previously mentioned set of pointers (lines 624-645). Image 0 (the first in the list) should probably be the single character zero. This can be used to clear a player area although setting the horizontal position to 0 will get the image off the screen as well.

Initial horizontal and vertical positions should be poked as in lines 650-660. The old and new vertical positions should be different or the images will never be loaded until they are. The image numbers for the different players have to be poked into locations 1552-1555 (line 690) and the normal PM single line resolution initilization given (line 670). Colors can be set (line 695) and finally, the VBI routine inserted (line 710).

The game 'Bankshot is fairly straightforward. There is one problem I was unable to fix. You are not supposed to shoot directly at the pockets. I put a flag (BOUNCE = 1 or 0) to determine if you do, but it doesn't always work. This is apparently due to the size of the ball and the configuration of the corner pockets. It's easy to have a collision with the rail almost simultaneously with the ball touching the pocket. I've tried extending the corner pockets out but that makes it too easy to sink the shot. If anyone figures out a way to handle this problem, let me know.

1536-1545 (0600-0609) Insertion routine
1551 (060F) PM Area Hi byte
1552-1555 (0610-0603) Image #'s (even only)
1556-1559 (0614-0617) Plyr horiz. pos.
1560-1563 (0618-061B) Old vert. pos.
1564-1567 (061C-061F) New vert. pos.
1568 and up (0620) Po
inters to images (Lo and Hi bytes)

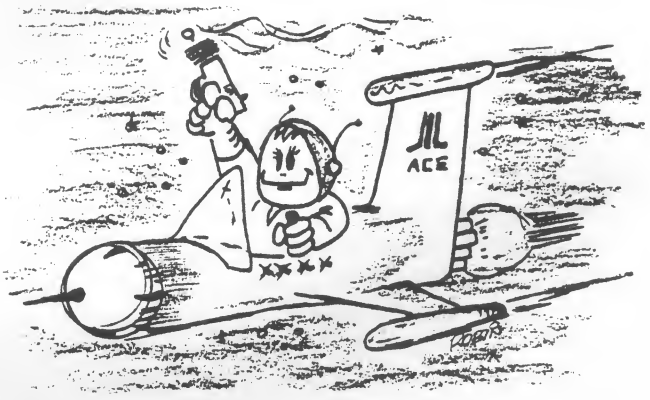
Note: 00CB-00CF also used

continued

BANKSHOT VBI ROUTINE

```
10 HPOS = $0614
20 OLDV = $0618
30 NEWV = $061C
40 APTR = $00CB
50 IPTR = $00CD
60 PMPG = $060F
70 IMGN = $0610
80 IMGP = $0620
90 STOR = $00CF
100 PLYRH = $D000
110      *=  $0000

120 VBI   CLC
130   LDA  PMPG ;ADD TO PM HI
140   ADC  #$04 ;FOUR PAGES TO GET
150   STA  APTR+1; PLYR AREA PTR HI
160   LDX  #$00 ;X IS PLYR COUNTER
170   STX  STOR
180   LDY  #$00 ;Y USED IN INDIR OPER.
190   STY  APTR

200 HORIZ LDA  HPOS,X ;UPDATE HOR.POS.
210   STA  PLYRH,X
220   LDA  NEWV,X ;CHECK IF VERT. POS.
230   CMP  OLDV,X ;CHANGED
240   BEQ  NXTPLYR ;SKIP IF NOT
250   LDA  NEWV,X ;UPDATE OLD VERT.
260   STA  OLDV,X ;POSITION

270 ZERO1  LDA  APTR ;CK. IF REACHED
280   CMP  NEWV,X ;VERT. POS. YET
290   BEQ  LDPLYR ;IF SO, START LOAD
300   LDA  #$00 ;ELSE FILL WITH
310   STA  (APTR),Y ; ZEROS...
320   INC  APTR ;UNTIL YOU DO
330   BEQ  NXTPLYR ;(OUT OF PLYR AREA)
340   BNE  ZERO1

350 LDPLYR LDA  IMGN,X ;USE IMAGE
NUMBER
360   TAX ;AS INDEX AND
370   LDA  IMGP,X   SET UP INDIR.
380   STA  IPTR ;POINTER
390   LDA  IMGP+1,X
400   STA  IPTR+1

410 PLBYTE LDA  (IPTR),Y ;GET IMAGE
420   BEQ  CLREST ;IF A ZERO, FINISHED
430   STA  (APTR),Y ;PUT IN PLYR AREA
440   INC  IPTR ;NEXT IMAGE BYTE
450   BNE  UPONE ;NO PAGE CROSSING
460   INC  IPTR+1 ;PAGE CROSSING

470 UPONE  INC  APTR ;NEXT AREA BYTE
480   BEQ  NXTPLYR ;REACHED END OF
AREA
490   BNE  PLBYTE ;NEXT IMAGE BYTE

500 CLREST LDA  #$00 ;ZERO OUT REST

510 ZERO2  STA  (APTR),Y ;OF PLYR AREA
520   INC  APTR
530   BNE  ZERO2

540 NXTPLYR INC APTR+1 ;NEXT AREA
550   LDX  STOR ;RECOVER PLYR INDEX
560   INX ;NEXT PLYR
570   STX  STOR ;SAVE INDEX
580   CPX  #$04 ;LAST PLAYER?
590   BNE  HORIZ ;NO, GET ANOTHER
600   JMP  $E462 ;BACK TO ATARI'S VBI
610      .END
```

```
= 0614 HPOS      = 0618 OLDV
  061C NEWV        00CB APTR
  00CD IPTR       060F PMPG

= 0610 IMGN      = 0620 IMGP
  00CF STOR        D000 PLYRH
  0000 VBI       0010 HORIZ

= 005D NXTPLYR   = 0024 ZERO1
  0035 LDPLYR      0043 PLBYTE
  0055 CLREST      004F UPONE
  0057 ZERO2
```



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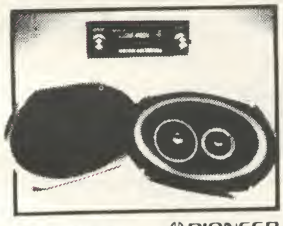

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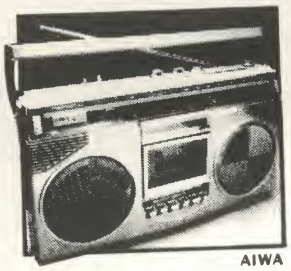

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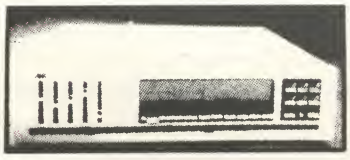

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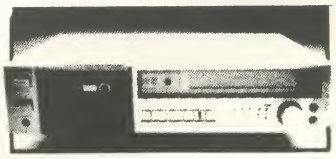

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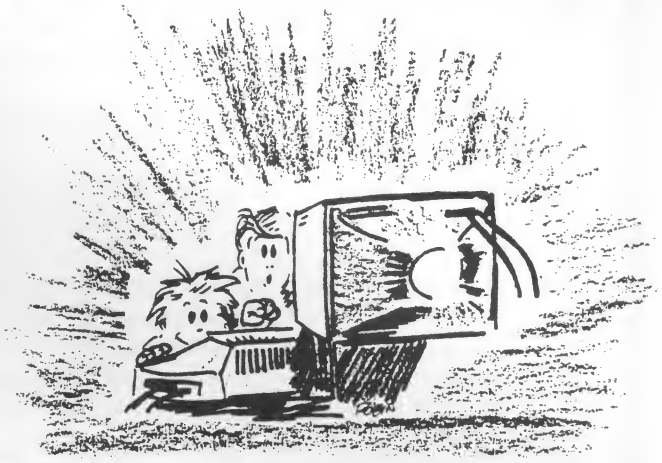
```
10 REM *****************
20 REM **  BANKSHOT  **
30 REM ** S.O. 4/82  **
40 REM *****************
90 OPEN #1,4,0,"K":GRAPHICS 18:POSITION
6,3:? #6;"BankShot"
100 POSITION 4,6:? #6;"# PLAYERS?":DIM
B$(16)
110 GET #1,NP:NP=NP-48:IF NP<1 OR NP>9
THEN 110
120 DIM SCORE(NP):POSITION 15,6:? #6;
NP:POSITION 4,9:? #6;"instructions?"
:GET #1,A:IF A=89 THEN GOSUB 2000
250 REM * VBI ROUTINE UPDATED BY
POKES *
260 DIM VB$(107):FOR I=1 TO 107:READ
A:VB$(I,I)=CHR$(A):NEXT I
270 DATA 24,173,15,6,105,4,133,204,
162,0,134,207,160,0,132,203,189,20,6,
157,0,208,189,28,6,221,24,6
280 DATA 240,63,189,28,6,157,24,6,165,
203,221,28,6,240,10,169,0,145,203,230,
203,240,42
290 DATA 208,239,189,16,6,170,189,32,6,
133,205,189,33,6,133,206,177,205,240,
14,145,203,230,205,208,2
300 DATA 230,206,230,203,240,10,208,
238,169,0,145,203,230,203,208,250,230,
204,166,207,232,134,207,224,4,208,168
302 DATA 76,98,228
350 REM * PAGE 6 - INSERT VBI ROUTINE *
360 FOR I=1536 TO 1545:READ A:POKE
I,A:NEXT I
370 DATA 104,160,0,162,0,169,7,76,92,
228
380 A=ADR(VB$):B=INT(A/256):
C=A-256*B:POKE 1538,C:POKE 1540,B
400 GRAPHICS 3:COLOR 1:PLOT 3,0:DRAWTO
 36,0:DRAWTO 36,19:DRAWTO 3,19:DRAWTO
 3,0
410 POKE 708,204:POKE 709,0:POKE 712,
233:COLOR 2:FOR I=1 TO 14:READ X,Y:PLOT
X,Y:NEXT I
420 DATA 3,0,3,1,4,0,19,0,36,0,36,1,
35,0,35,19,36,19,36,18,19,19,3,19,3,
18,4,19
430 A=PEEK(560)+256*PEEK(561)
440 IF PEEK(A)<>66 THEN A=A+1:GOTO 440
450 POKE A,71:POKE A+3,6:POKE A+4,
6:POKE A+5,65:POKE A+6,PEEK(A+7):POKE
 A+7,PEEK(A+8)
480 POKE 656,0:POKE 657,24:? "  ":GOSUB
1500
600 REM * PLAYER MISSILE SETUP *
610 A=PEEK(106)-16:POKE 54279,A:POKE
1551,A
620 REM ** IMAGE 4 **
624 DIM CUR$(6):FOR I=1 TO 6:READ A:
CUR$(I,I)=CHR$(A):NEXT I:CUR=
 ADR(CUR$):POKE 1573,INT(CUR/256)
625 POKE 1572,CUR-256*PEEK(1573)
626 DATA 16,16,56,16,16,0
628 REM ** IMAGE 2 **
630 DIM BALL$(9):FOR I=1 TO 9:
 READ A:BALL$(I,I)=CHR$(A):NEXT I:
 BAL=ADR(BALL$):POKE 1571,INT(BAL/256)
632 POKE 1570,BAL-256*PEEK(1571)
640 DATA 16,56,108,116,124,124,56,16,0
642 REM ** IMAGE 0 **
645 DIM Z$(1):Z$=CHR$(0):ZERO=
 ADR(Z$):POKE 1569,INT(ZERO/256):
 POKE 1568,ZERO-256*PEEK(1569)
650 FOR I=1556 TO 1567:READ A:POKE
I,A:NEXT I
660 DATA 120,100,86,86,100,30,53,53,
120,40,63,63
670 POKE 559,62:POKE 53277,3
690 POKE 1552,2:POKE 1553,4:POKE
1554,0:POKE 1555,0
695 POKE 704,36:POKE 705,0
700 A=USR(1536)
710 YMIN=38:YMAX=177:XMIN=62:XMAX=86:
LL=0:PLYR=0:B$="OOOOOOOOOOOOOOOO":
GOSUB 1500
720 FOR I=1 TO NP:SCORE(I)=0:NEXT I
730 POKE 77,0:BALL=BALL+1:IF BALL>15
THEN GOTO 3000
735 POKE 656,0:POKE 657,5:? BALL
740 X=INT(RND(0)*100+70):
 Y=INT(RND(0)*100+70):POKE 1556,X:
 POKE 1564,Y
743 IF FL=1 THEN FL=0:GOTO 750
745 PLYR=PLYR+1:IF PLYR>NP THEN PLYR=1
747 POKE 656,0:POKE 657,14:? PLYR
749 REM ** MOVE CURSOR ALONG RAIL **
750 S=STICK(0):XP=PEEK(1557):
YP=PEEK(1565):X=PEEK(1556):Y=PEEK
 (1560)
760 IF XP>XMIN AND XP<XMAX THEN 780
765 IF (S=10 OR S=14 OR S=6) AND
YP>YMIN+2 THEN YP=YP-1
770 IF (S=9 OR S=13 OR S=5) AND YP<YMAX
THEN YP=YP+1
780 IF YP>YMIN+2 AND YP<YMAX THEN 795
785 IF (S=5 OR S=6 OR S=7) AND XP<XMAX
THEN XP=XP+1
790 IF (S=9 OR S=10 OR S=11) AND XP>XMIN
THEN XP=XP-1
795 POKE 1557,XP:POKE 1565,YP
800 IF STRIG(0)=1 THEN 750
805 R=SQR((XP-X)*(XP-X)+(YP-Y)*(YP-Y))
810 DELY=2*(YP-Y)/R:DELX=2*(XP-X)/R
880 BOUNCE=0:MOVE=0
```

continued

```
885 REM ** LOOP TO MOVE BALL **
890 X=X+DELX:Y=Y+DELY
892 IF PEEK(53252)=2 THEN GOSUB
1000:GOTO 940
900 IF X>=XMAX OR X<=XMIN+1 THEN
DELX=-DELX:GOSUB 1800
910 IF Y>=YMAX OR Y<=YMIN+1 THEN
DELY=-DELY:GOSUB 1800
920 POKE 1556,X:POKE 1564,Y
930 POKE 53278,0:MOVE=MOVE+1:IF
MOVE<150 THEN 890
940 POKE 53278,0
970 REM ** FL=1 IF SOMEBODY SCORED **
980 IF FL=1 THEN 730
982 REM ** FL=2 IF SHOT INTO POCKET **
985 IF FL=2 THEN FL=0:GOTO 740
990 GOTO 745
1000 POKE 1556,0:IF BOUNCE=0 THEN POKE
656,1:POKE 657,3:? "MUST BANK SHOT!!
":FL=2:GOTO 1020
1010 SCORE(PLYR)=SCORE(PLYR)
+1:FL=1:B$(BALL,BALL)=CHR$(48+PLYR):
 GOSUB 1500
1020 FOR I=1 TO 30:SOUND 0,150+I,12
,10:NEXT I:FOR I=120 TO 180:SOUND
 0,I,10,10:SOUND 0,0,0,0:NEXT I
1030 FOR I=50 TO 30 STEP -5:GOSUB
1600:NEXT I:GOSUB 1500:RETURN
1500 POKE 656,1:POKE 657,3:? B$:RETURN
1600 SOUND 0,I,10,10:FOR J=1 TO 5:NEXT
J:SOUND 0,0,0,0:RETURN
1800 BOUNCE=1:SOUND 0,50,10,10:FOR I=1
TO 5:NEXT I:SOUND 0,0,0,0:RETURN
2000 ? CHR$(125):POKE 752,1:POSITION 8,3:?
"INSTRUCTIONS":? :? "This is a game of one
ball pool for"
2010 ? "up to 9 players. All players use":?
"joystick 1. Balls are made one at"
2020 ? "a time and must hit at least one":?
"rail before going in a pocket to"
2030 ? "count. If a player makes a ball,":? "he
gets another turn."
2040 ? :? "Position the cursor on the rail ":?
"where you want the ball to first"
2050 ? "hit. The scorecard at the bottom":?
"keeps track of which player hit the"
2060 ? "balls"
2070 ? :? :? "Press any key to begin the game."
2080 GET #1,A:RETURN
3000 GRAPHICS 18:POSITION 5,0:? #6;
"Final Score":FOR I=1 TO NP:POSITION
 3,I:? #6;"Plyr #";I;" - ";SCORE(I)
3005 NEXT I
3010 GOTO 3010
```



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PUZZLER PAGE

MACE PUZZLE #1 WINNERS

The contest for Puzzle #1 is over and what a response! Besides Michigan, we heard from Lockport, Illinois; Hillsborough, North Carolina; Oregon, Ohio; and from 11 year old Jason LeDuc across the river in Windsor. The puzzle was solved using Basic, APL, PLI, and Fortran. Where are all you Assembler wizards? The programs were run on an Atari 800, a Radio Shack Model III, a DEC 2050, an IBM 370/168, and an Amdal 470.

The ultimate program in shortness was submitted by **Burt Gregory** who solved the puzzle using one single APL statment in .003 seconds. Only a fraction of a second slower, but one day earlier to the post office, was one of our two winners, **Chris Ratkowski**. Chris used Fortran to find the answer in just .02 seconds. That's ok Chris, whats .017 of a second anyway. Our other winner, both by the way had their letters postmarked July-16, was **Mark Sokolik** who used Basic on his Atari-800. His solution took 177.25 seconds which is about average for all the submissions that were done using Atari Basic.

If you never quite solved the puzzle, here is Mark's solution for you to run.

```
10 DIM GROUP(1000):POKE 559,0
15 FOR X=1 TO 1000:GROUP(X)=1:NEXT X
20 P=1:L=1:D=0:F=0
30 IF F=0 AND GROUP(P)=1 THEN
GROUP(P)=D:L=P:F=1:P=P+1:IF P>1000 THEN
P=1
40 IF KILL = 1000 THEN GOTO 100
50 IF GROUP(P)=1 THEN F=0
60 P=P+1:IF P>1000 THEN P=1
70 GOTO 30
100 POKE 559,34:? "LAST ONE KILLED IS ";L
```

And who was that last person?
976

In the future, please date your entry to assist in reading the postmark. Some of them are very difficult to decipher. Also, for those of you out of state who asked, it doesn't make any difference how long it takes the letter to reach MACE; it will be postmarked with the date you put the letter in the mailbox and that is what determines the winner.

EDITOR'S NOTE

As promised, both Chris and Mark will receive a MACE disk or tape of their choice.

MACE PUZZLE #2- Since last month's newsletter went out late, the deadline for puzzle 2 will be extended to the deadline for this month's puzzle, October 12, 1982. This means that winners will be run a month later in MACE, but it will allow more time to work on the puzzles.

AUTHORS DETERMINE WINNERS- The authors of the MACE Puzzles presented here are responsible for determining the winners to their respective puzzles. Any questions concerning a puzzle should be directed to the particular author involved. MACE will award the prizes either in person at a meeting, or by mail. Contestants must be sure to CLEARLY print your name, address, and telephone number so that we can contact you if necessary.

Anyone wishing to submit a puzzle may do so. Write MACE for further information.

And now....on with the show!

MACE PUZZLE #2

By Charles Godfrey

Credit for this months puzzle goes to Judy Lawler of Phoenix. This is really great, I hope you have as much fun finding the answer as I did. By the way, there can be more than one answer, but I am looking for the lowest possible correct figure.

Since the deadline for puzzles extends beyond the deadline for the MACE newsletter the answers will probably be two months behind.

continued

PUZZLE #2

Shipwrecked in a hurricane, five saliors in a rowboat landed on a small island inhabited by one monkey and numerous coconut trees. The trees had just finished bearing a bumper crop of coconuts, all of which had blown to the ground in the hurricane.

Having nothing better to do, the sailors decided to gather all the coconuts on the island into a single pile. They finished the job by nightfall, and then fell soundly asleep. But one sailor awoke in the middle of the night and became worried that he wouldn't receive his fair share of the milky palm fruit. He stole away to the pile and removed exactly his fair share of the coconuts, buried them, and went back to sleep. Another sailor awoke a short time later and did the same--buried his fair share of the coconuts and returned to sleep. Each of the three remaining sailors, in turn, did likewise.

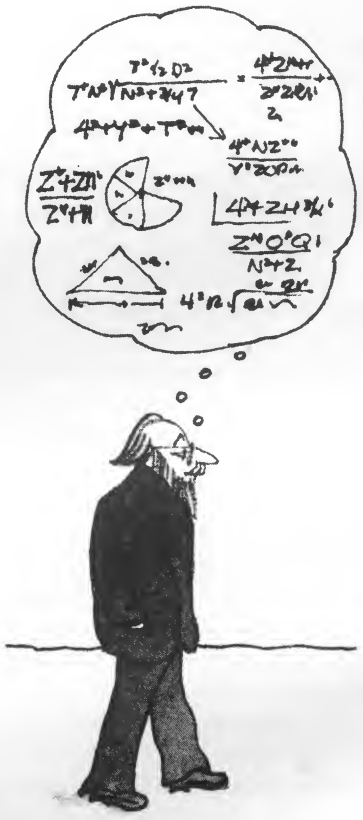
The next morning, not suspecting what each of the others had done, the sailors divided the remaining coconuts, and each received his equal share. One coconut remained, which they gave to the monkey.

Yourjob? Write a program to determine the total number of coconuts in the original pile. Only a few lines of code are required to find the solution.

Please send your solutions to:

Charles Godfrey
29646 Chelmsford
Southfield, MI 48076

Puzzle deadline is midnight October 12, 1982. Winner(s) will receive a MACE disk or tape of their choice. In the event of a tie, more than one winner may be declared.



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